

No. 785,317.

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G. A. MANWARING, V. H. EMERSON, F. L. CAPPS & E. E. NORTON.

SOUND RECORD.

APPLICATION FILED OCT. 4, 1904.

Fig. 1.

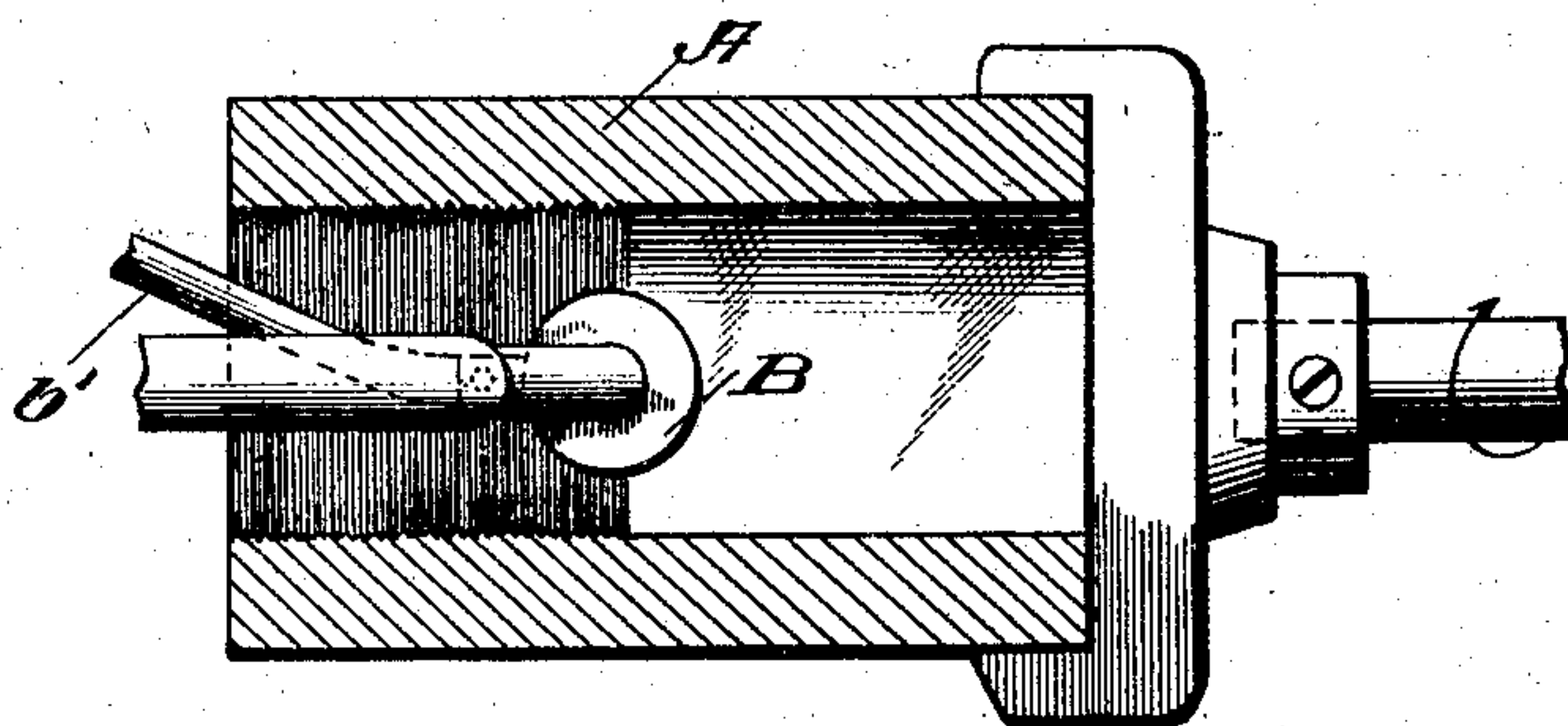


Fig. 2.

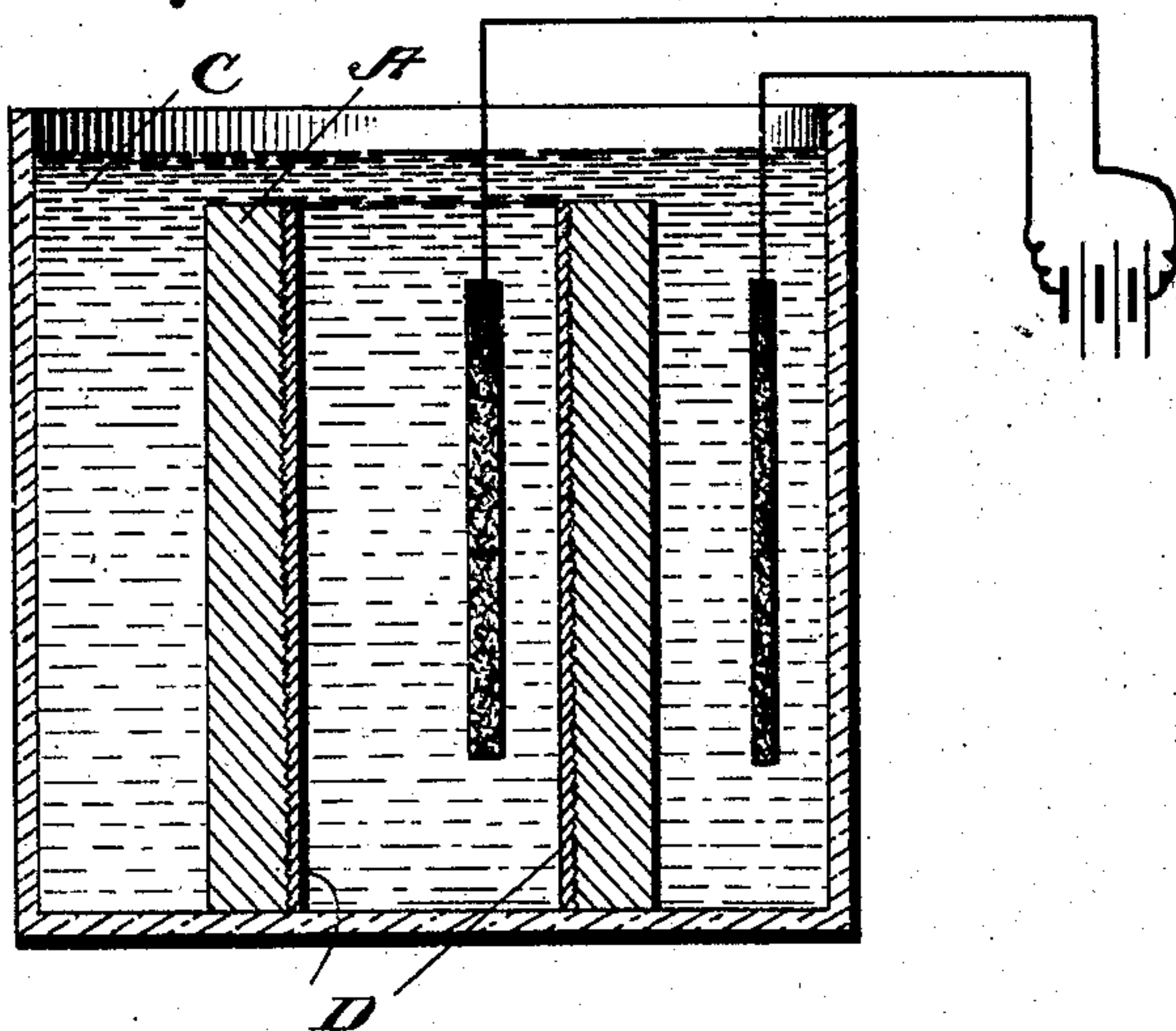
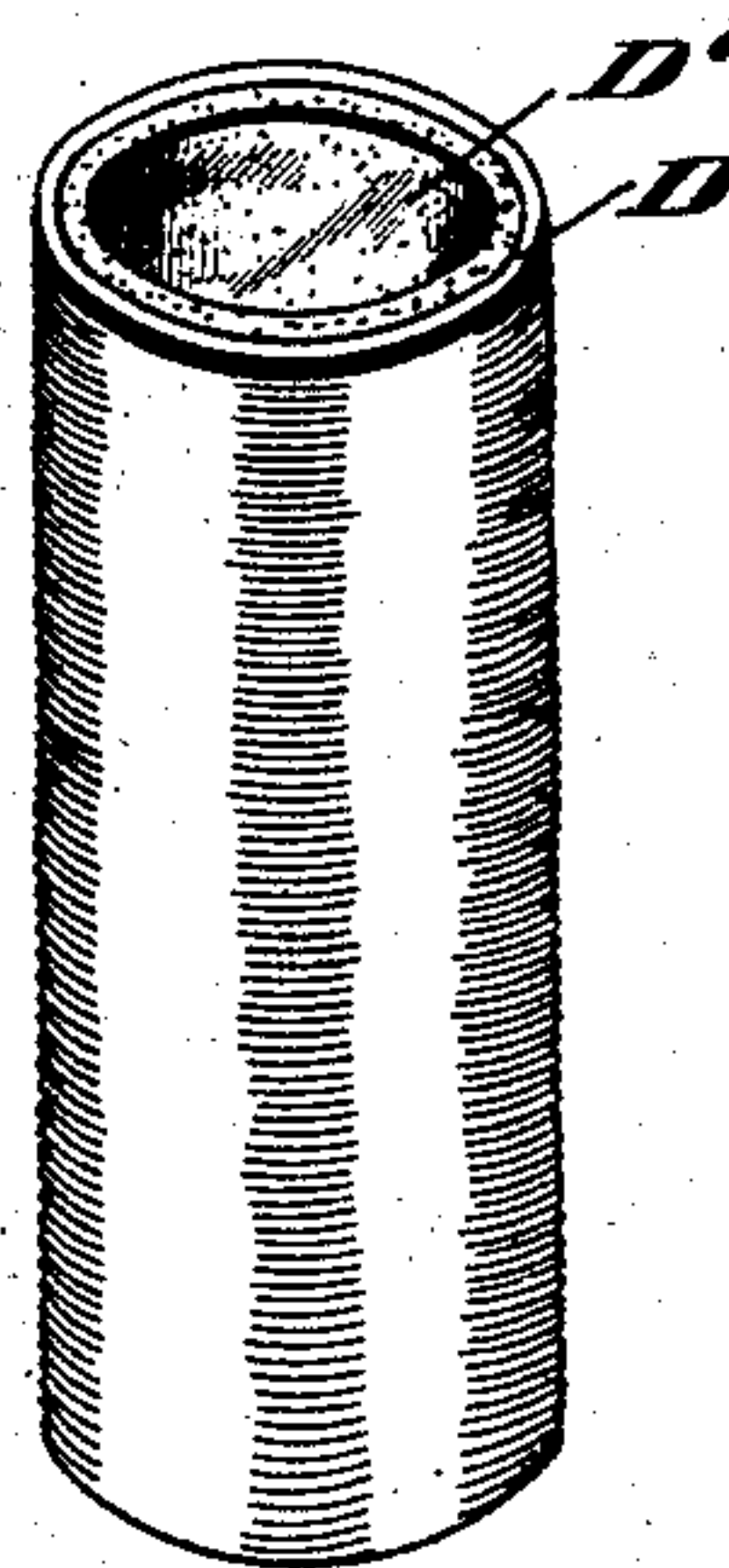


Fig. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

GEORGE ABBOTT MANWARING, OF BAYONNE, AND VICTOR H. EMERSON, OF NEWARK, NEW JERSEY, FRANK L. CAPPS, OF LONDON, ENGLAND, AND EUGENE E. NORTON, OF NICHOLS, CONNECTICUT, ASSIGNORS TO AMERICAN GRAPHOPHONE COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF WEST VIRGINIA.

## SOUND-RECORD.

SPECIFICATION forming part of Letters Patent No. 785,317, dated March 21, 1905.

Original application filed April 14, 1904, Serial No. 203,233. Divided and this application filed October 4, 1904. Serial No. 227,170.

*To all whom it may concern:*

Be it known that we, GEORGE ABBOTT MANWARING, of Bayonne, Hudson county, and VICTOR H. EMERSON, of Newark, Essex county, New Jersey, FRANK L. CAPPS, residing in London, England, and EUGENE E. NORTON, of Nichols, Fairfield county, Connecticut, all citizens of the United States, have invented a new and useful Improvement in Sound-Records, which is fully set forth in the following specification.

Our invention relates to the production of metallic cylindrical sound-records which are primarily intended for use in nurling commercial sound-records, but which may be used for other purposes.

The present application is a division of our pending application, Serial No. 203,233, filed April 14, 1904. In that application we described and claimed the method of producing commercial sound-records in quantities, which, in brief, consists in first making an original sound-record upon the inner wall or bore of a hollow cylinder, next depositing an electroplate upon this interior surface, and finally removing this electroplated cylinder from the original record, after which this metal record is ready for nurling or other use.

In the accompanying drawings, Figure 1 is a longitudinal sectional view representing the formation of the original record upon the interior of a cylinder. Fig. 2 is a similar representation of the cylinder while in a plating-bath, and Fig. 3 is a perspective of a metallic sound-record forming the subject-matter of the present application.

A represents a hollow cylinder composed of suitable material, which for convenience may be designated "wax" or "wax-like," being of any substance suitable for making original sound-records.

B represents a recording device which contains a diaphragm and a recording-stylus acted upon by sound-waves through a tube *b'* according to well-known principles. If de-

sired, the bore of cylinder A may be slightly tapered to facilitate subsequent removal of the electroplate. The cylinder is caused to revolve, and the recording device is caused to progress longitudinally within the cylinder by any suitable mechanism. The mere production of an original sound-record upon the internal surface of a hollow cylinder is not in itself new and may be accomplished by any desirable means. This original sound-record is electroplated (as in a bath C in the usual manner) to secure the electroplate D, deposited upon the record-surface within the bore of the cylinder A. This electroplate D will preferably be backed up by a strengthening-core D', which may be of any desirable material and may be secured to the cylinder D in any convenient manner. The electroplate, with its backing, is then removed from the cylinder A and is ready for use. This electroplated cylinder D is an integral and continuous (seamless) unitary article, having the sound-record proper formed in reverse upon its external surface and having no longitudinal ridge or fin to mar its record-surface.

We are aware that metallic record-cylinders have been proposed heretofore; but our metallic record differs from them, as will now be pointed out. Such records have sometimes been made by direct mechanical action, the recording-stylus operating (in more or less ineffective fashion) to cut or gouge out the material upon the external surface of the metallic cylinder. Owing to the comparative feebleness of the sound-waves and the comparative hardness of metal the record proper—*i. e.*, the actual cuts or gouges—is shallow (where made) and is an inaccurate representation of the path of the recording-stylus. In short, such records are impracticable and worthless. Our new metallic record differs from these in that, first, it is of electrodeposited metal; second, having the record in reverse, and, third, in that it corresponds truly and accurately with the original sound-waves.



Metallic record-cylinders have also been formed by electroplating upon the exterior of an original record-cylinder; but in this case the record proper is found upon the interior of the metal cylinder—that is, within its bore—and sometimes such tubular metal records have been cut through longitudinally and flattened out or even rolled up in such manner as to present the record upon the exterior of the cylinder thus formed; but in the latter case the cylinder will present a seam where the two edges have been joined. Our new metallic record differs from these articles in presenting the record upon its exterior and in being seamless. The presence of the seam, it is needless to say, renders the record absolutely worthless either for direct audible reproduction or for nurling commercial records.

Metallic record-cylinders have also been formed by electroplating with a different metal upon the inner surface of the metallic cylinders referred to in the preceding paragraph and then removing the latter by the action of acid. The records thus formed are not in reverse and are therefore unfitted for nurling, since the knurled records would have ridges instead of grooves and could not be employed

with the talking-machines now on the market. Our new records differ from these metallic records in having the sound-record on the exterior surface in reverse ready for making a knurled cylinder with its sound-record in the normal position.

Having thus described our invention, we claim—

A seamless cylinder presenting as its exterior surface an electrodeposited sound-record in reverse.

In testimony whereof we have signed this specification in the presence of the subscribing witnesses.

GEORGE ABBOTT MANWARING.  
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FRANK L. CAPPS.  
EUGENE E. NORTON.

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